

TAPE APPLICATING AND SEVERING ASSEMBLY

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to machines for applying double-coated pressure-sensitive adhesive tape strips.

2. Prior Art

U.S. Pat. No. 3,472,724 issued Oct. 14, 1969 to J. H. Casey discloses an apparatus which is suitable for feeding a length of tape to an applying pad, across a severing member, which will sever and apply the tape to a substrate. This device will apply double-coated pressure-sensitive adhesive tape strips. It is often desirable when applying double-coated tape, especially a double-coated foam tape, that the tape strip after it is applied not have a liner on one surface. In order to apply the tape however it is necessary to contact one surface of the tape. With double coated tape this would require contact with one adhesive surface if the liner were previously removed. In a device as illustrated in the above mentioned patent the pad is supplied with gripping means or a vacuum to hold the cut strips and the liner adhered thereto while the exposed opposite surface of the tape is applied to the receptor surface.

BRIEF SUMMARY OF THE INVENTION

The present invention solves the problems of prior art devices by providing a tape applying head wherein a release liner carries the double-coated tape to an applying station and holds the tape in position during application to a substrate. This permits the double-coated tape to be applied without the liner on one surface. The device of the present invention has a frame supporting a convolutely wound roll of double-coated tape disposed on a release liner. The tape is carried to severing means by the release liner where the tape, but not the liner, is cut transversely into strips. The liner carries the severed tape strips to an applying station where an applying arm places the strips on the surface of a moving substrate. The applying arm has an applying end and a rotating end, the rotating end being mounted on a driven eccentric. The arm has a cam track associated therewith which extends along a portion of the length of said arm. A cam member, mounted on a driven eccentric, engages the cam track at a point between the applying end and the rotating end of the cam.

Means is provided to move the liner with the tape strips thereon from the severing means to an applying position at the end of the applying arm and to move the liner past the applying position to a disposal station after application of the tape. Indexing means register the cut strips of tape at the end of the applying arm in position for application to the substrate. As the rotating end and cam member rotate on their eccentrics, the applying end of said applying arm is moved in a narrow foil shaped biconvex path when viewed in plan.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be fully understood after reading the following description which refers to the accompanying drawing wherein

FIG. 1 is a plan view of an applicator constructed according to this invention with the applying arm in the applying position;

FIG. 2 is an elevational view of the applicator of FIG. 1;

FIG. 3 is a fragmentary plan view illustrating the applying arm upon completion of an applying cycle;

FIG. 4 is a fragmentary plan view illustrating the applying arm as it returns to start an applying cycle;

FIG. 5 is a fragmentary plan view illustrating the applying arm as the arm is starting an applying cycle;

FIG. 6 is a fragmentary sectional view of the applicator illustrating the drive gears; and

FIG. 7 is a diagrammatic plan view illustrating the path of the tip of the applying arm.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the accompanying drawing in which like numerals refer to like parts throughout the several views, one adhesive coated surface of a double-coated pressure-sensitive adhesive tape 10 is in contact with a tape metering roller 16 which draws the tape and associated release liner 12 from a convolutely wound supply roll 14 of tape and liner. The metering roller 16 will be formed of a release material such as silicone rubber. A uniform pressure is maintained between the tape metering roller 16 and tape 10 by means of a pressure roller 18. The roller 18 is mounted on a link 20 pivoted to the frame 17 by a stud 21. The link 20 is urged towards the metering roller 16 by means of a spring 19 to maintain a firm contact between the tape 10 and the tape metering roller 16.

To dispense tape, the tape metering roller 16 is rotated stepwise or is indexed a fractional amount of a revolution stripping tape from the supply roll 14. As shown, the metering roller 16 is intermittently driven by means including a driven shaft 79 rotating a pair of cams 22 which have axially spaced lobes. Each lobe has a depression 23, the depressions being spaced at 180°. As the cam 22 is driven at a constant rate of speed, the depressions 23 make contact with opposed pins 25 in an intermittent drive wheel 24. As shown, there are 8 pins in a star arrangement so that the tape metering roller 16 will be advanced 1/8 revolution each time the intermittent drive wheel is advanced by a cam 22 through a gear train shown in FIG. 6.

After being withdrawn by the tape metering roller 16, the liner and tape pass across a roller 26 which cooperates with severing means. As shown, the severing means comprises a heated elongate thin blade 30 mounted on a pivotable arm 32 which is rotatably mounted on pin 33 attached to the frame 17. The arm 32 and the associated knife 30 are oscillated by eccentric 31 which includes a bushing 34 with rod 35 rigidly attached thereto. The end of this rod 35 opposite said eccentric 31 is in the form of a piston 37 slideably mounted in a housing 38. As the eccentric 31 rotates the piston 37 moves in the housing 38. A chamber 39 formed by the piston 37 and housing 38 nearest the eccentric is normally maintained under a small positive pressure applied by a valve 29 which adjusts the air and therefore the cutting pressure of the blade. As the rod 35 is pulled towards the tape 10 the air in chamber 39 is compressed causing the housing 38 and arm 32 to which it is attached pivotally by a pin 36 to move towards the tape. The heated blade 30 severs the tape and adhesive by rapid brief contact with the tape to